## **Interpreting the `firebase.indexes.json` File**

The `firebase.indexes.json` file provides information about the indexes used in our Firestore database. Indexes are essential for optimizing the performance of database queries.

### **1.** **Index for `tasks` Collection**

* **Fields Indexed:**
  + cropsId (in ascending order)
  + cultureDay (in descending order)
* **Purpose:** This index helps quickly retrieve tasks related to specific crops, sorted by the day of cultivation in descending order.

### **Index for `reports` Collection**

* **Fields Indexed:**

o plantationId (in ascending order)

o dateReport (in ascending order)

* **Purpose:** This index is used to efficiently find reports for a particular plantation, sorted by the date of the report in ascending order.

### **2.** **Composite Index for `reports` Collection**

* **Fields Indexed:**

o \_userObject.\_id (in ascending order)

o archived (in ascending order)

o plantationId (in ascending order)

o dateReport (in ascending order)

* **Purpose:** This composite index allows for complex queries that filter reports by user ID, whether they are archived, plantation ID, and report date.

### **3.** **Additional Index for `tasks` Collection**

* **Fields Indexed:**

o cropsId (in ascending order)

o cultureDay (in ascending order)

* **Purpose:** Similar to the first index for `tasks`, but with both fields sorted in ascending order for different query requirements.

### **4.** **Index for `tasks` Collection (by `plagueId`)**

* **Fields Indexed:**

o plagueId (in ascending order)

o cultureDay (in ascending order)

* **Purpose:** This index allows for efficient querying of tasks related to specific plagues, sorted by the day of cultivation.

### **5.** **Index for `actions` Collection**

* **Fields Indexed:**

o \_userObject.\_id (in ascending order)

o isNotified (in ascending order)

o applyDate (in ascending order)

* **Purpose:** This index helps in retrieving user actions, filtered by user ID, notification status, and the date the action was applied.

## **Summary**

* Collections Involved: `tasks`, `reports`, and `actions`.
* Indexed Fields: `cropsId`, `cultureDay`, `plantationId`, `dateReport`, `\_userObject.\_id`, `archived`, `plagueId`, `isNotified`, `applyDate`.
* Indexing Purpose: The indexes are created to optimize queries for retrieving specific documents based on various criteria, such as crops, plagues, plantations, dates, user IDs, and notification statuses.
* By examining these indexes, we can understand how the database is structured to support efficient data retrieval for different use cases and queries.